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Historical scenes will be represented in the "round" and in low relief. These modelings will be cast in plaster or baked in the kiln. The casts may or may not be colored. Literature will be illustrated in the same way. Animals and insects will be modeled, and studies will be made of their homes and habits.

Some modeling of the flora of the region selected for investigation will be done, showing the adaptations of the plant to its changing environment, and recording its growth under different conditions.

Should they be required, relief maps will be made in connection with the geography.

CHALK-MODELING.¹

IDA CASSA HEFFRON.

It will be the purpose in these lessons to lead the teachers to form vivid, definite images of typical features of the earth's surface, and to acquire the power to sketch easily and rapidly such features on the board and on paper. The materials used will be : blackboard and chalk, pencil and paper, and charcoal.

Clay- and sand-modeling will be used as a preparation for the chalk-modeling ; the different landscape forms and surface features will be studied from descriptions, photographs, pictures, stereopticon views, maps, and from models. Many of the features—for instance, river valleys, bluffs, beaches, ravines, and sand dunes—can be studied and sketched on the field excursions planned by the geographic department. Hints also will be given on the use of putty, and the making of plaster casts of maps in relief.

The first topic for consideration will be typical surface features and landscapes characteristic of the continents, such as plains, mountains, rivers, glaciers.

The next topic for attention will be pictorial or panoramic representation of larger sections of surface, as, for instance, river basins, mountain chains, plateaux, bird's-eye views of the

¹ This outline has been adapted largely from Mr. Thorne-Thomsen's syllabus of last summer.

continents, etc. The sketches under this head, by combining the features studied before into larger units of surface, form a compromise between map and picture, and serve as an introduction to the next topic, that of relief maps.

After a careful study of the most important features under I and II, the teachers will be prepared to begin the making of relief maps, Topic III.

The last topic relates and applies the work of the previous topics to the study and teaching of the continents; it thus serves the purpose of a review of the whole subject.

DETAILS OF OUTLINE.

PRINCIPLES OF CHALK-MODELING — TECHNIQUE.

NOTE. — This part of the outline will not be taken up as a separate topic, but will be related to and discussed with the other topics.

CHALK-MODELING AS A MODE OF EXPRESSION.

Aim to describe, through the medium of chalk or charcoal, geographic features scientifically, rapidly, and at the same time artistically. This is possible where there is intense interest, a definite motive, and clear images, accompanied with feeling.

1. Chalk-modeling as a representation of mass; significance of term "modeling" (relief); use of lines in analysis of landscape. Economy of time and effort.

2. Composition : essentials and non-essentials.

3. Direction : Relation of slope of surface to direction of line : (a) Rolling surface — hills, waves. (b) Sloping surface — valleys, volcanoes, mountains. (c) Level surface — plain, beach, flood plain with winding river. (d) Steep surface — bluffs and cliffs, falls. (e) Combination of horizontal and vertical surfaces — buttes, mesas, plateaux ; cañons and fiords ; flood plain with bluffs.

4. The landscape seen from different points of view. (a) Perspective : atmospheric effect ; diminution of size, convergence of lines, and foreshortening ; the horizon line ; details of foreground ; color values, light and shade, shadows. (a) Compare use of white material on board, black material on paper.

5. How to show texture of surface : (a) Stratified and unstratified rock. (b) Alluvial, sandy, and rocky soil. (c) Cultivated and uncultivated ground. (d) Surface of water, ice.

6. Analysis of characteristics of landscape. (a) Slopes ; angles of slope ; concave and convex surfaces. (b) Curves, as beach curves, river curves. (c) Natural lines : meeting of surfaces ; divides, shore-lines, drainage lines, sky-line. (d) Means of showing height, dimensions, magnitude.

I. SURFACE FEATURES AND LANDSCAPE FORMS TO BE CHALK-MODELED.

A. *Coast scenery*. — (1) Waves and breakers. Capes, cliffs, stacks ; reefs and islands ; isthmuses ; beaches, raised beaches ; caves ; sand dunes ; spits, bars, lagoons ; bays, estuaries, sounds. (2) Rising and sinking coasts, partly drowned coasts. (3) Appearance of coast-line according to stage of development. (4) Topography of lake flats, Chicago area as a type. (5) Artificially protected coast, harbors, piers, breakwater ; lighthouses ; wharves. (6) Types of boats.

B. *River scenery*. — (1) Landscape characteristic of upper, middle, and lower course of a river. (2) Deltas and alluvial fans ; bars, banks, islands ; terraces ; types of waterfalls, lakes. (3) Types of valleys, gaps ; forms of river erosion of dry or wet plateaux. (4) Successive stages in the wearing down of the land ; youth, maturity, old age (cycle of denudation). (5) Human features connected with rivers, as embankments and levees ; irrigation canals ; dams, locks, bridges. (6) Boats. (7) Underground water : caves, sinkholes, springs ; geysers ; natural bridges.

C. *Glacial scenery*. — (1) Types of glaciers ; valley glacier, continental glacier, Piedmont glacier. (2) Topographic features of glaciated country ; valleys channeled by ice, fiords, cirques. Glacial lakes : rock basins, Swiss lakes, Scotch lochs ; morainic lakes. Moraines and drumlins ; kames and eskers ; islands. Glaciated rock-floor with boulders. Icebergs.

D. *Mountain scenery*. — (1) Types of mountains : mountains by folding — Jura, Alps ; block mountains — Oregon ridges, Sierra Nevada ; mountains by denudation — table mountains, Scandinavian mountains ; laccolitic mountains. (2) Characteristic features of mountain scenery : (a) Types of peaks — needles, horns, domes — Castle Craigs, Mätterhorn, Pike's Peak. (b) Ridges — Alleghany ; ranges — Bernese Oberland ; systems, chains, cordilleras. (c) Valleys — longitudinal, transverse ; parks, mountain pass, cirques, edge (*Kamm*). (d) Snowfields, glaciers, torrents. (3) Young, old, worn-down mountains (Monadnocks). (4) Volcanoes : (a) Lava cone, ash cone. (b) Famous volcanoes: Vesuvius, Stromboli, Mt. Shasta, Chimborazo, Fuji-san Mauna Loa. (c) Crater lakes, caldera ; volcanic necks, dike. (5) Plateaux : young plateau, deeply dissected plateau, mesa.

E. *Landscape as affected by climate*. — (1) Desert, oasis ; tundras, arctic landscapes ; steppes and prairies ; tropical forests, jungles, savannas ; temperate forests ; swampy country ; cultivated surface, fields of grain, corn, rice. (2) Trees and plants which have a determining influence on appearance of landscape, as conifers, palms, cactus, mangrove trees. (3) Cloud forms.

F. *Surface features determined by climate*. — (1) Waste slopes and fans. (2) Bad Lands. (3) Topography of interior basins, salt lakes, salinas, playas. (4) Sand dunes of the desert.

G. *Ocean*.—(1) Appearance in quiet, in storm. (2) Arctic sea, floe ice, pack ice, icebergs. (3) Oceanic islands, volcanic and coral islands. Sea bottom with corals. (4) Types of vessels.

II. PANORAMIC VIEWS.

(1) River basins, plateaux, cordilleras, interior basins, cross-sections. (2) Bird's-eye views of the Mississippi basin, the Great Basin, Abyssinian plateau, Nile basin, plateau of Thibet. (3) Of North America from north to south, east to west.

III. MAPS.

(1) Function of chalk-modeled map compared with other maps. (2) Difference between map and picture. (3) Relief maps in sand. (4) Steps in making a chalk-modeled map ; question of light and shade ; unity of surface ; gradation of color as to elevation ; contrast of color ; elimination of details ; fallacy of making a flat surface with highlands superimposed. (5) Map representation of main features of a continent, as river basins, plateaux, mountain chains, hills. (6) Maps of the continents on the board and on paper. (7) Special maps : Egypt, Greece, Italy, India, China. Map of the Chicago area.

IV. PARTICULAR STUDY OF THE CONTINENTS—NORTH AMERICA AND EURASIA AS TYPES.

(1) Map of the continent, sectional maps. (2) Panoramic views. (3) Forms of landscape characteristic of the physiographic areas. (4) Important scenic features of the continent.

The different surface forms will be considered from the point of view of form, and as factors in determining appearance of landscape. The full discussion of these features with regard to their formation and geographic significance will be given in the course in geography.

The detailed outline above is suggestive of the work to be done in chalk-modeling, and offers material for the selection of the teachers ; it may not be taken up in its entirety, or followed in the order indicated, but will be closely related to the lessons in geography.

TEXTILES.

CLARA ISABEL MITCHELL.

THE course in textile arts combines handwork, laboratory study, and discussion of a correlated course of study.